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Studies on the Rocky Mountain flora — XXII

PER AXEL RYDBERG

ERIGERON

Just as the writer resumed his work on *Erigeron*, Coulter and Nelson's New Manual of Botany of the Central Rocky Mountains came out. From all evidences it is apparent that most of the work in connection with the new book has been done by Professor Aven Nelson, of the University of Wyoming. The work is a great improvement on the old Coulter's Manual and it is perhaps the best manual that has been put out treating on the botany of the West. It has, however, many features to which the present writer is unwilling to subscribe. Dr. B. L. Robinson in his recent review* has pointed out the unevenness in the nomenclature, in that the Vienna Code has been followed in some cases, in other cases not. But this is easy for me to understand, for Professor Nelson has until lately followed the "Rochester Code," and it is not so easy to change the nomenclature of one's thinking and writing and make it self-consistent.

A few years ago, when Professor Nelson published his "New Plants from Wyoming" in the Bulletin of the Torrey Botanical Club, he was about as "radical" as the present writer, and had about the same limitation of species. If we should judge from the New Manual, his conception of a species seems to have changed considerably, as seen from the number of specific names reduced to synonymy. Whether this change of attitude has slowly grown upon Professor Nelson or is due to influence from his collaborators, I can not tell. There is, however, one feature in this connection that seems to me somewhat unexplainable. Professor Cockerell in his review† of the book stated:

"I have had the curiosity to count the number of species admitted as valid in the new manual, which were undescribed at the time of the publication of the first edition in 1885. They

*Rhodora 12: 13-16. Ja 1910.

†Science II. 31: 302. 1910.

number 787, about 28 per cent. of the whole flora . . . Of the 787, no less than 244 were proposed by Professor Aven Nelson himself; 152 are by Dr. Rydberg, of the New York Botanical Garden, and 148 by Dr. E. L. Greene, now of the U. S. National Museum, but at one time a resident of Colorado. . . . The number of species accepted as valid is 2,733, while no less than 1,788 specific names are rejected as synonyms or insufficiently known. Many of those latter were proposed by Professor Nelson himself, more by Rydberg and Greene."

Why should more (nearly 66 per cent. more) of Professor Nelson's species be acceptable and "many more" of Dr. Greene's and my own be reduced to synonymy? Not counting the time before the first edition of the Manual of the Rocky Mountain Region appeared, Dr. Greene published on the flora for ten years, between 1885 and 1895, when practically no work was done by Professor Nelson or myself, and he has published at least twice as many new species from the Rocky Mountain Region as Professor Nelson. Both Dr. Greene and myself have had access to much larger herbaria and libraries than has Professor Nelson, and have seen specimens from the Rockies which he has not seen. The New Manual, therefore, seems to show a decided partiality for the species proposed by Professor Nelson himself. Some partiality would be expected, but in this case it seems out of proportion. Professor Nelson is a very conscientious worker, and it would be unjust to claim that this imparity in treatment was intentional. The main cause, I think, is that he had not seen the types or authentic material of many of the species so reduced. He knew his own species, but not all of those proposed by other botanists. It was not fair to them simply to reduce their species to synonymy, if such species were unknown. If question-marks had been added to show probable synonymy, the matter would have been improved considerably. There are many cases in which I am confident that Professor Nelson had no specimens illustrating species reduced to synonymy.

Some years ago I spent considerable time on *Erigeron* as represented in the Rockies and had seen the type or a duplicate of the type of nearly every species described. In fact, I knew the genus (one of the largest in the region) as well as any of the composite genera. That I should have resumed the work on that genus just

as I received the New Manual was a curious coincidence. There is scarcely a genus, in which I, from my standpoint, could pick out so many flaws of treatment in the New Manual. This paper, therefore, has become an adverse criticism of the New Manual, more so than I had intended or wished.

The way in which the authors of the New Manual have determined what species should be regarded as good and which names should be reduced to synonymy, is rather interesting. Many of Dr. Greene's species and my own have been reduced, while others of older authors and of Nelson's have been kept up. The uneven treatment, as I have said before, is due in some cases to the fact that the authors had not seen the types. *Erigeron lapiluteus* A. Nels. (*E. yellowstonensis* A. Nels.) is regarded as distinct from the exceedingly close *E. droebachensis*, and *E. trifidus* from *E. compositus*; while *E. jucundus* Greene is made a variety of the little related *E. acris* L., *E. multifidus* Rydb. is made a synonym of *E. compositus*, and *E. flabellifolius* Rydb. one of *E. trifidus*. The fact is that *Erigeron multifidus* Rydb. is much closer to *E. trifidus* than to *E. compositus* and grades directly into it. The typical *E. compositus* is rare and more distinct. I think, though, that they are all three forms of one species, while *E. flabellifolius* has nothing to do with either. It has a stoloniferous rootstock instead of a caespitose caudex and the leaves do not at all suggest *E. trifidus* but are more like those of *Ranunculus Eschscholtzii* in outline.

Erigeron conspicuus Rydb. is made a synonym of *E. speciosus* DC. In the herbarium of Columbia University there is a duplicate of the type of *E. speciosus* DC., collected by Douglas. In this the stem and leaves are perfectly glabrous except the ciliate margins of the latter and the plant is closely related to *E. macranthus* Nutt., perhaps not distinct. *E. conspicuus* Rydb. is considerably hairy on both the stem and the leaves, and if reduced should be included in *E. subtrinervis* Rydb. rather than in *E. speciosus*. If the type of *E. conspicuus* were placed before a student and he used the key of the New Manual, it would be named *E. subtrinervis*.

Both *Erigeron salicinus* Rydb. and *E. platyphyllus* Greene are made synonyms of *E. macranthus* Nutt. While the first is

closely related to that species, the second can scarcely be said to be so. Its habit, foliage, and pubescence are those of *E. subtrinervis* and only the involuclral bracts are those of *E. macranthus*.

Erigeron incanescens Rydb., *E. eximius* Greene, and *E. viscidus* Rydb. are all made synonyms of *E. formosissimus* Greene. The first has a hirsute involucre and is related to *E. subtrinervis*; the third and fourth have glandular-puberulent involucre and may well be united. The authors have included *Erigeron formosissimus* also among the annuals or biennials, though it is evidently a perennial. The third has also glandular involucre, but is almost glabrous and should have been included in *E. asper* of the New Manual if reduced.

Erigeron glabellus Nutt., *E. consobrinus* Greene, *E. oblanceolatus* Rydb., and *E. Earlei* Rydb. are made synonyms of *E. asper* Nutt. *E. glabellus* and *E. Earlei* have perennial branched rootstock; the rest are biennial with tap-roots. They may perhaps sometimes be perennial, but there is no evidence of a branched rootstock. In *E. glabellus* the pubescence is spreading, in *E. Earlei* closely appressed.

Erigeron nematophyllus Rydb. is made a synonym of *E. Eatonii* A. Gray. The latter is not uncommon in Utah, where I have collected it myself. A duplicate of the type is in the Columbia University herbarium. It has narrowly linear-oblancoolate, distinctly triple-nerved basal leaves and decidedly flattened achenes. In *E. nematophyllus* the leaves are almost filiform and strictly one-nerved. Evidently Professor Nelson did not know *E. Eatonii*, for what he has distributed under that name is *E. nematophyllus*. The only specimens of the real *E. Eatonii* from Wyoming in our collections are from Wind River Mountains, and there collected by Merrill & Wilcox and by Tweedy.

Erigeron curvifolius Piper is made a synonym of *E. luteus* A. Nels., although they are not closely related, the former being a coarsely hirsute plant, with leafy stem, the latter being a closely strigose subcaulescent plant. It would have been much better to reduce Nelson's own *E. luteus* to a synonym of *E. peucephyllus* A. Gray, to which it is closely related.

Erigeron Parryi Canby & Rose, *E. Scribneri* Canby, and *E.*

vetensis Rydb., are made synonyms of *E. radicans*. *E. vetensis* has an involucre of two series of subequal bracts, a simple pappus, consisting of bristles only, of which some are occasionally shorter. Both *E. Parryi* and *E. Scribneri* have 3 or 4 series of bracts, more imbricated and more flat, obovate-cuneate achenes and double pappus, the outer squamellate. Both are closely related to *E. montanensis*, which Nelson refers to *Wyomingia*.

ERIGERON YELLOWSTONENSIS A. Nels. Bot. Gaz. 31: 198. 1900
Erigeron lapiluteus A. Nels.; Coult. & Nels. New Man. Cent.
Rocky Mts. 530. 1909.

Professor Nelson states in the New Manual that *Erigeron yellowstonensis* is a name to be rejected, but he does not state on what ground, probably because it is of barbaric origin, regarded from a Latin standpoint. But what should be said about *E. lapiluteus* which is to replace it? Is it Latin? It is probably meant to be derived from *lapis*, stone, and *luteus*, yellow. In making a compound word the Romans usually took the stem of the first word and connected it with the second word by means of the connecting vowel *i*. The stem of *lapis* is *lapid*, as seen from the genitive *lapidis*. The proper form would then have been *lapidiluteus*. But what would that have meant? Usually the Romans placed the modifying word first (not always though), as is done in the English, and the name *Erigeron lapidiluteus* would mean the "stone-yellow fleabane." The intention was evidently to name it the "fleabane of the yellow stone." The only proper way to express this would be by the specific name *lapidis lutei* or, as it has become the custom in botany to capitalize proper names, and use a hyphen when the specific name consists of more than one word, *Lapidis-lutei* or *Lutei-lapidis*, as the order of the adjective is indifferent.

Professor Nelson states also that "the variety *droebachensis* [of *E. acris*] probably does not occur in our range." *Erigeron droebachensis* Muell., is as common in the Rockies as is *E. yellowstonensis*. The question is whether they should be kept apart specifically. The only difference I can find is that the latter is more hairy with shorter hairs, decidedly glandular-puberulent in the inflorescence, and the involucre is more decidedly hirsute. In the

herbarium of the New York Botanical Garden there are several Scandinavian specimens of *E. droebachensis* Mueller (*E. Muelleri* Lund.), one from the vicinity of Christiania; the town of Droebach is only a short distance south of Christiania. These specimens are perfectly matched by specimens from Quebec, Subarctic America, Yukon, Canadian Rockies, and Colorado. *Erigeron acris* L., which is included in the New Manual, is on the contrary not found in America. It differs from all the North American species of the group, except the very rare *E. alpinus*, in having villous rather than hirsute or puberulent involucre.

ERIGERON COMMIXTUS Greene, Pittonia 5: 58. 1902

E. cinereus A. Gray, Mem. Am. Acad. 4: 68. 1849. Not *E. cinereus* H. & A. 1836.

E. colo-mexicanus A. Nels.; Coult. & Nels. New Man. Cent. Rocky Mts. 529. 1909.

Another specific name proposed by Professor Nelson, *Erigeron colo-mexicanus*, to replace the untenable *E. cinereus* A. Gray, is in my opinion rather distasteful. Fortunately I do not need to use the name, as the same species has been described by Dr. Greene under the name *E. commixtus*.

ERIGERON UNIFLORUS L. Sp. Pl. 864. 1753

The typical form of this species is, so far as I know, not found on this continent. As Dr. Greene has pointed out, the European species is characterized by narrow erect or ascending rays. This character is found also in *Erigeron pulchellus unalaschkensis* DC. Prod. 5: 287 (*E. uniflorus pulchellus* Fries), which is not uncommon in America from Greenland to Labrador, Montana, and Alaska. In the latter the involucre is more or less turbinate, tapering into the enlarged end of the stem, and black-hairy, while in the typical *E. uniflorus* the involucre is hemispheric, and more or less white-hairy, and the stem is not thickened. Whether the two are specifically distinct or not is hard to tell. In Greenland both forms are found. If the variety is to be regarded as a species, ***Erigeron unalaschkensis*** (DC.) is the only available name, as *E. pulchellus* has been used by Michaux for another species.

The plant referred to *Erigeron uniflorus* in the Flora of Colorado

is distinct and easily distinguished by its broad spreading rays. The name it should bear is *E. simplex* Greene. *E. leucotrichus* Rydb. is a more luxuriant form of the same. It is questionable if *E. melanocephalus* Nelson should not be included in it also, differing only in the blackish hairiness of the involucre.

Professor Piper in his flora of Washington has transferred the name *Erigeron filifolius* (Hook.) Nutt. to what was usually known under the name *E. peucephyllus* A. Gray. This change was wholly unwarranted, I think. There are duplicates of the types of both *Diplopappus filifolius* Hook. and *Erigeron filifolius* Nutt. in the Columbia University herbarium, and they both belong to the species described under the latter name in Gray's Synoptical Flora. What probably led Professor Piper astray was the following words in Hooker's description: "*radiis flavescentibus.*" This does not necessarily mean that the plant has yellow rays. The original meaning of *flavescens* is turning (light) yellow. White flowers often turn yellowish in drying. As *E. filifolius* has white as well as violet rays, the rays are often yellowish in drying.

WYOMINGIA

As instituted in the New Manual this genus is very unsatisfactory, for if the more imbricated bracts with thickened backs are made the distinguishing character separating *Wyomingia* from *Erigeron*, then *E. Garrettii* A. Nels., *E. tener* A. Gray, *E. Tweedyi* Canby, *E. caespitosus* Nutt., *E. nevadensis* A. Gray, *E. luteus* A. Nels., *E. filifolius* Nutt., etc., should be included in *Wyomingia*. If the achenes should count for anything, *E. montanensis* and perhaps *E. canus* could not very well be included. The former has flattened achenes and the latter has glabrous and 8-10-nerved achenes, while the rest of the genus has pubescent and 4-5-angled achenes. It would be desirable to take out *Wyomingia* as a genus, for the plants fit rather poorly in *Erigeron*, but the question is where to draw the line. The species with flattened achenes with the involucre of *Wyomingia* would constitute a rather natural genus, but such species as *E. utahensis* destroy the distinctness.

ANTENNARIA

A footnote under this genus in the New Manual states: "The treatment of this genus is largely an adaptation of Professor Elias

Nelson's clear and discriminating revision of a large part of the genus." While Elias Nelson's treatment is in the main excellent, the writer is inclined to take some exceptions to this as well as to that of the New Manual. In the latter we find the following key of the *A. alpina* group:

Stems very slender, 2-7 cm. high.	1. <i>A. media</i> .
Stems medium, 8-15 cm. high.	
Leaves broadly spatulate; involucre 6-7 mm. high.	2. <i>A. fusca</i> .
Leaves spatulate-oblongate; involucre about 5 mm. high.	
Leaves obtuse, tomentose.	3. <i>A. reflexa</i> .
Leaves acute, canescent.	4. <i>A. umbrinella</i> .

The only species that can be separated out by this key is *Antennaria fusca*. The key is not workable otherwise. *A. media* is often 8-10 cm. high and *A. umbrinella* and *A. reflexa* are often less than 7 cm. high. In both *A. reflexa* and *A. umbrinella* as limited in the New Manual and in E. Nelson's paper are the leaves both tomentose and canescent, as the one word indicates the kind of pubescence, and the other word the color of the same. E. Nelson merges *A. mucronata* E. Nels. in *A. umbrinella* Rydb. and *A. flavescens* Rydb. in *A. reflexa* E. Nels. Under the latter he makes the following statement: "In describing *A. umbrinella* Dr. Rydberg confused two species . . . The male and female plants of his type are of different species. One of these he later named *A. flavescens*, and the staminate plants of this and his *A. umbrinella* are identical." It is true that there were a few staminate specimens of *Antennaria flavescens* mixed in the type collection of *A. umbrinella*, but there were also a few staminate specimens of the latter. I saw the plant in field, as I was present when Professor J. Flodman collected the type, but we did not then notice that another species was growing with it. The staminate plants of *A. umbrinella*, *A. flavescens*, and *A. reflexa* are very much alike and hard to separate. *A. flavescens* has somewhat narrower bracts and the leaves are usually more or less yellowish and with a very fine and closely appressed silky tomentum. The difference between the staminate plants of *A. umbrinella* and *A. reflexa* I can not describe. The staminate plant of *A. mucronata* is very different, more resembling that of *A. media*, but the inner bracts are nearly white, the outer very dark brown. E. Nelson states that typical staminate plants are unknown. The only ones I

have seen and which I think belong here are *Goodding* 430, from Ten Sleep Lakes, Big Horn County, Wyoming, and labeled *A. nardina*.

The pistillate plants of the four species are easier to distinguish. *Antennaria mucronata* has very dark greenish brown bracts, as dark as those of *A. media* but the inner bracts are oval, obtuse or even rounded at the apex, and inclined to be white-tipped. The leaves of the rosettes are narrower and with more appressed pubescence. The bracts of the pistillate head of *A. umbrinella* have about the same shape as those of *A. mucronata* but are from light umber-brown to almost yellowish, and of the same color throughout. The leaves are much shorter and broader, like those of *A. media*, but with appressed tomentum. The bracts of the pistillate heads of *A. flavescens* are still lighter than those of *A. umbrinella*, being yellowish or brownish white, oblong and scarcely more than half as broad, but still obtuse. The leaves are yellowish. It would have been better to have designated *Rydberg & Bessey* 5146 instead of 5145 as the type, because the former number contains pistillate as well as staminate plants. The pistillate heads of *A. reflexa* have bracts of a color similar to that of *A. umbrinella* but they are decidedly acute and resemble those of *A. media* in shape.

The staminate plants of this group are very rare, except in *Antennaria flavescens*, in which it is the common form, the pistillate plant being comparatively rare. In the herbarium of the New York Botanical Garden the staminate plants are represented by the following specimens:

- Antennaria alpina* (L.) Gaertner: *J. Källström* (Tronfjeld, Norway).
A. monocephala DC.: *Wm. Horne* (Karluk, Alaska), *Blaisdell* (Cape Nome, Alaska).
A. media Greene: *Hall & Chandler* 686 (Mt. Goddard, Calif.); *Sonne* 160 in 1888 (Bear Creek, Placer Co., Calif.) and in 1892 (Coldstream, Calif.).
A. mucronata, E. Nels.: *L. Goodding* 430 (Ten Sleep Lakes, Wyo.).
A. umbrinella Rydb.: *Flodman* 859 (partly) (Long Baldy, Mont.); *Macoun* 69339 (Meyer's Creek, B. C.); *Umbach* 615 (Midvale, Mont.); *Rydberg & Bessey* 5164 (Mt. Chauvet, Idaho); *Shear & Bessey* 3971 (Steamboat Springs, Colo.).

A. flavescens Rydb.: many specimens.

A. reflexa E. Nels.: *Goodding* 114 (Pedro Mountains, Wyo.); *Goodding* 380 (Doyle Creek, Wyo.); *A. Nelson* 853 (Union Pass, Wyo.).

A. pulvinata Greene: *Richardson* (?), from Hooker's herbarium.

Antennaria rosea (D. C. Eat.) Greene has a peculiar history. The citation of Eaton should perhaps be omitted, for Eaton* gave no description. The first description was given by myself under the name *A. parvifolia*,† on the supposition that it was the same as *A. parvifolia* Nutt.‡ It might have been included partly in the description of that species, but Professor Piper has shown that Nuttall's type belongs rather to *A. aprica* Greene. It was afterwards described by Greene as *A. rosea*,§ the author giving *A. dioica rosea* Eaton as a synonym. As that was a *nomen nudum*, it should be "ignored" as Greene|| stated later, and *A. rosea* is based wholly upon Greene's description. The type of *A. rosea* would then be *Sheldon* 128, which is first cited, rather than *Watson* 652, which is not cited at all. *Sheldon* 128 is the monotype of Greene's *A. sordida*.¶ The proposer of the latter must have forgotten or ignored what he had done a year earlier. E. Nelson gives *A. sordida* as a synonym of his *A. rosea angustifolia*, based on my *A. angustifolia*.** There is no use of keeping up a variety if the type of the species belongs to the variety! Besides, *Sheldon* 128 and *Watson* 652 are almost identical. *A. angustifolia* Rydberg is somewhat similar, but has narrower involucre bracts, of which the inner are very acute. It is not found in the Rocky Mountain region.

In the New Manual, *A. anaphaloides* Rydb. is made a synonym of *A. pulcherrima*. Piper, who is fully as "conservative" as A. Nelson, keeps them distinct, however. So did also E. Nelson. The description of *Antennaria pulcherrima* in the New Manual is an almost verbatim copy of my description of *A. anaphaloides*. The description, especially that of the pistillate head, does not

*Bot. King Exp. 186. 1871.

†Bull. Torrey Club 24: 301. 1897.

‡Trans. Am. Phil. Soc. II. 7: 406.

§Pittonia 3: 281. 1898.

||Pittonia 4: 81. 1899.

¶Pittonia 4: 81. 1899.

**Bull. Torrey Club 26: 546. 1899.

at all agree with a duplicate of the type of *A. pulcherrima* in the Torrey herbarium. In the latter, the bracts are imbricated in 6 or 7 series, wholly brown, the innermost very narrow and acuminate. *A. foliacea* Greene is wholly ignored, although E. Nelson had it in his paper. *A. Sierrae-Blancae* Rydb. is made a synonym of *A. rosulata*, although the words "leaves glabrate above" are added after the reference. Probably the authors had not seen any specimens. The characters of the bracts (not referred to) are a better distinction than the mere lack of tomentum. On the other hand, *Antennaria oblancoolata* Rydb. is kept distinct from the closely related *A. luzuloides*. In the key the latter is placed under the heading "bracts tomentose except the scarious tips"; but in the description is stated "involucres glabrous nearly or quite to the base." The latter characterization is correct and *A. luzuloides* should be associated with *A. oblancoolata* instead of *A. pulcherrima* in the key.

***Antennaria acuta* sp. nov.**

A surculose-stoloniferous perennial; stems slender, 5-12 cm. high; stolons short and mostly ascending; basal leaves and those of the stolons narrowly oblanceolate, greenish-white, tomentose on both sides, glabrate in age, 15-25 mm. long, 2-4 mm. wide, acute or abruptly short-acuminate; tomentum very fine and appressed; stem-leaves narrowly linear or linear-oblanceolate; heads 3-5, conglomerate, sessile; involucres about 6 mm. high, tomentose below; bracts of the pistillate heads lanceolate to linear-lanceolate, dark greenish brown with slightly lighter tips, the inner acute.

This is related to *Antennaria alpina* and *A. media*. It resembles perhaps most the former but the leaves are equally tomentose on both sides. From *A. media* it differs in the narrower, acute or acuminate leaves with a finer, closely appressed tomentum.

ALBERTA: Marsh near Lake O'Hara, Aug. 8, 1904, *J. Macoun* 65423 (type in herb. N. Y. Bot. Gard., duplicate in herb. Geol. Surv. Canada); also Bow River at Laggan, July 25, 1904, 65413; and Pipestone Creek, July 6, 1904, 65422.

GNAPHALIUM

In Coulter & Nelson's New Manual both *Gnaphalium sulphurens* Rydb. and *G. thermale* E. Nels. are cited as synonyms of

G. Wrightii. *G. thermale* is closely related to that species and may be regarded as a form thereof by a conservative systematist, but the first one named is not.

At the end of the description of *Gnaphalium Wrightii* the following note is given: "*G. thermale* E. Nels. Bot. Gaz. **30**: 121. 1900, the description of which is here used." If *G. thermale* is to be included in *G. Wrightii*, it is at least not the normal condition of that species and the description of the small *G. thermale* gives a poor idea of *G. Wrightii*, which is a tall plant, 3–5 dm. high. To use the description of one species for another is as a rule very unsafe, unless the identity is established without any doubt.

Gnaphalium albescens Osterh., *G. proximus* Greene, and *G. lagopodioides* Rydb. are not accounted for at all in the New Manual, although they were described from material collected in the region covered by the work. The first, I think, is a pure synonym of *G. Wrightii*; the other two, as well as *G. sulphurescens*, are closely related to *G. chilense* Sprengel (*G. Sprengelii* H. & A.). All three have the obtuse bracts and subdecurrent leaves of that species. *G. proximus* was based on *Aven & Elias Nelson 6036* and is closest to *G. chilense*. The specimens were distributed as *G. Sprengelii* and are evidently included in *G. chilense* in the New Manual. If *G. sulphurescens* should be reduced to synonymy it should be under *G. chilense* not under *G. Wrightii*.

Gnaphalium uliginosum L. is also omitted, although it has been collected in both Colorado and Utah.

Gnaphalium angustifolium A. Nels. is antedated by both *G. angustifolium* Lam. and *G. angustifolium* Loisel.; but as those species now are referred to *Helichrysum* it may be that *G. angustifolium* is tenable according to the Vienna Rules. A poor rule indeed, when the validity of the name *G. angustifolium* A. Nels. depends upon whether two species of the Old World are kept in *Gnaphalium* or not. Three years after *G. angustifolium* A. Nels. was published, the proposer of that species substituted the name *G. exilifolium*, which name is wholly ignored in the New Manual.

***Gnaphalium Williamsii* sp. nov.**

Probably biennial; stem 3–6 dm. high, branched above, loosely floccose; leaves linear or linear-lanceolate, decurrent, 5–10 cm. long,

almost equally floccose on both sides with loose, not dense tomentum, sometimes slightly glandular; inflorescence large, corymbosely paniculate; heads somewhat conglomerate at the ends of the branchlets; involucre hemispheric or nearly so, 6 mm. high, only slightly tomentose at the base; bracts broadly ovate, acute, light straw-colored or white; achenes glabrous; pappus straw-colored.

This species is intermediate between *Gnaphalium microcephalum* and *G. decurrens*; perhaps more closely related to the latter, of which it has the general habit and the larger nearly hemispherical involucre, but the leaves are nearly as tomentose above as beneath. They are slightly if at all glandular; the stem is not at all so. The pubescence is that of *G. microcephalum* but the inflorescence is more open and inclined to be flat-topped and both the involucre and its bracts are much broader.

MONTANA: Columbia Falls, Aug. 11, 1894, R. S. Williams (type, in herb. N. Y. Bot. Gard.); woods, Belton, Aug. 25, 1903, Umbach 752.

NACREA A. Nels.

I believe that this genus is based on the essentially staminate plant of *Anaphalis*. There is a duplicate of the type of *Nacrea lanata* in the herbarium of the New York Botanical Garden, but the specimens are so young that the real structure of the flowers can not be made out. It may be that Nelson had better developed material on hand. The expressions "akenes (immature in these specimens)" indicate, however, that he did not have developed fruit. The so-called staminate flowers of *Anaphalis* are in reality hermaphrodite flowers with sterile pistils. (See Bentham & Hooker, *Genera Plantarum*.) The styles in them are undivided and the achenes remain undeveloped. In the description of *Nacrea* there is nothing said about the styles being undivided or 2-cleft. In the herbarium of the New York Botanical Garden there are two specimens collected in the Big Horn Mountains, one by T. A. Williams in 1898, and the other by Dr. H. Hapeman in 1892, which (especially the first mentioned) are so close in every respect to the duplicate of the type of *Nacrea lanata*, that anybody would take them for the same species. They are better developed and belong without doubt to an *Anaphalis*. Whether they can be separated specifically from *A. subalpina* is doubtful.

Anaphalis angustifolia sp. nov.

Perennial with a creeping rootstock; stems slender, strict, simple, white-tomentose, 3-6 dm. high; leaves narrowly linear, 1-nerved, 5-10 cm. long, 2-5 mm. wide, ascending, densely white-tomentose beneath, less so above, greener and often glabrate in age; inflorescence small, corymbiform, 2-3 cm. high, 3-4 cm. wide; heads hemispheric; involucre about 5 mm. high; bracts pearly white, elliptic, obtuse or acutish.

This species is more related to the eastern *Anaphalis margaritacea* than to *A. subalpina*, having narrow and 1-ribbed leaves, but differs in the smaller inflorescence, smaller heads, narrower bracts, and narrower and ascending instead of spreading leaves.

MONTANA: Mount MacDonald, July, 1900, *Elrod & assistants* (type, in herb. N. Y. Bot. Gard.); Big Fork, Aug. 9, 1901, *Umbach* 15.

BALSAMORRHIZA

Professor Nelson has reduced *Balsamorhiza hirsuta* Nutt. and *B. terebinthacea* Nutt. to varieties of *B. Hookeri* and *B. macrophylla* respectively. Although the first has a superficial resemblance in the cutting of the leaves to *B. Hookeri*, it is much more closely related to *B. macrophylla* in every respect, differing only in the smaller heads and more dissected leaves. In his key Professor Nelson gives the following characters:

Leaves entire or somewhat toothed.	1. <i>B. sagittata</i> .
Leaves not entire, laciniately dentate to bipinnatifid.	
Green, glabrous or sparingly hisute.	2. <i>B. macrophylla</i> .
Canescent or lanate.	
The sericeous pubescence appressed or spreading.	3. <i>B. Hookeri</i> .
The white tomentum often floccose.	4. <i>B. incana</i> .

How would it be possible to locate *B. Hookeri hirsuta* by means of this key? As its leaves are pinnatifid, green, and hirsute, it would key into *B. macrophylla* instead of *B. Hookeri*. On the following page Professor Nelson gives only the following: "The pubescence roughish hirsute and spreading, not canescent or tomentose," as distinguishing the var. *hirsuta* from *B. Hookeri*, just the same characters which he in the key has used as separating *B. macrophylla* from *B. Hookeri*. The latter is not found within the range.

Balsamorhiza terebinthacea Nutt. is not closely related to *G.*

macrophylla. In the latter the outer involucrel bracts are elongated and reflexed; the former has the involucre of *B. Careyana* with appressed bracts. I doubt that *B. terebinthacea* is found east of northwestern Idaho.

It is a kind of puzzle to me, to determine what rule Professor Nelson followed in making these reductions. The specific name *terebinthacea* (1833) is much older than *macrophylla* (1841), and even where Nuttall transferred the former from *Heliopsis* to *Balsamorhiza* it has page priority. If united, *B. terebinthacea* should be the species and *B. macrophylla* the variety.

Balsamorhiza floccosa Rydb. and *B. tomentosa* Rydb. were reduced to synonyms of *B. incana* and *B. sagittata* respectively. It may be admitted that they (especially *B. tomentosa*) are closely related to the species to which they are referred, but I doubt if the authors of the New Manual have seen authentic material of either. In the Bulletin of the Torrey Botanical Club, November, 1900, I gave a synopsis of the Rocky Mountain species of this genus, and have not found any material change to make since that time.

***Gymnolomia linearis* sp. nov.**

Perennial with a rootstock or slender caudex; stems 3-4 dm. high, terete, strigose; leaves opposite, short-petioled, narrowly linear, 3-4 cm. long, 2-4 mm. wide, entire, hirsutulous, indistinctly 3-nerved, sparingly hispid-ciliate at the base; heads long-peduncled; involucre about 6 mm. high, 12-15 mm. broad; bracts linear-lanceolate, canescent-strigose; rays 10-12 mm. long, 3-4 mm. wide.

This species resembles *Gymnolomia longifolia* and *G. annua* in leaf form and general habit, but it is a perennial. From *G. multiflora* it differs in the narrow leaves and the slender perennial base, which would be classified rather as a rootstock than a caudex. The type number was included in *G. multiflora* by Robinson and Greenman* as a narrow-leaved form. The other specimens cited by them as belonging to this form, I have not seen, but probably they should be included in *G. linearis*.

UTAH: St. George, 1877, *E. Palmer* 241 (type, in herb. Columbia Univ.).

*Proc. Boston Soc. Nat. Hist. 29: 92. 1899.

Gymnolomia ciliata (Robins. & Greenm.) Rydb. sp. nov.

Gymnolomia hispida, var. *ciliata* Robins. & Greenm. Proc. Boston Soc. Nat. Hist. 29: 93. 1899.

HELIANTHUS

The authors of the New Manual have reduced *Helianthus aridus* Rydb. to a synonym of *H. petiolaris*. Although the forms of its leaves resemble those of that species, *H. aridus* is much more closely related to *H. lenticularis* (*H. annuus* of the Manual), which is indicated by the form of the bracts and the pubescence. If it should be reduced at all, it should be made a variety of *H. lenticularis*. It may even be a depauperate form of that species.

Helianthus giganteus is omitted, although unquestionable specimens have been collected in Colorado. (See my Flora of Colorado, page 372.)

HELIANTHELLA

In the New Manual *Helianthella uniflora* is described in the key as having a purple disk. In all specimens I have seen the disk-corollas are yellow. *H. Douglasii* is not included in the flora, although it has been collected in Montana by F. W. Anderson and Tweedy, in the Yellowstone Park by Tweedy, and south thereof in Wyoming by C. C. Curtis. (See also my Flora of Montana and the Yellowstone National Park.)

ENCELIOPSIS

Enceliopsis nutans (Eastwood) A. Nels., from Colorado and Eastern Utah, is omitted in the New Manual. This is strange, as Professor A. Nelson is the author of the name *Enceliopsis* as well as of the combination *E. nutans*.

BIDENS

Bidens bipinnata L. is included in Coulter & Nelson's New Manual. I have not seen any specimens from the Rocky Mountain region that could be referred to that species. *B. Bigelovii* is, however, found in Colorado. *Crandall 2726*, *Shear 4587*, *Clements 64* and *82*, all resemble so closely the Mexican Boundary Survey *no. 582* and *no. 582a*, from which *B. Bigelovii* was described, that there is no doubt about the identity. Duplicates of

these two numbers of the Boundary Survey are in both the herbarium of the Columbia University and that of the New York Botanical Garden. The structure of the marginal achenes distinguishes *B. Bigelovii* at once from *B. bipinnata*.

THELESPERMA

In the description of *Thelesperma ambiguum* in Coulter & Nelson's New Manual, we find the following: "bracts of the outer involucre 8, subulate-linear, almost equalling or half the length of the inner," etc. In Wright's specimens, from which *T. ambiguum* was described, the outer bracts are ovate or elliptic, scarcely one fourth as long as the inner involucre. What is described in the New Manual is evidently *T. intermedium* Rydb. When I described the latter, I had known it for about ten years and had never been able to make it agree with Dr. Gray's description of *T. ambiguum* in the Synoptical Flora. In the original publication of *Thelesperma ambiguum* no diagnosis is given, only a few characters distinguishing it from related species. In habit *T. ambiguum* resembles most *T. subnudum*, having the creeping rootstock of that species, the long naked peduncles, and the leaves found near the base of the stem only. The range is given as Montana to New Mexico and Texas. This was probably taken from the Synoptical Flora. The specimens on which Dr. Gray extended the range to Montana belong to *T. marginatum*, in many respects closely related to *T. ambiguum* but with discoid heads. *T. ambiguum*, as far as I know, is not found north of southern Colorado. *T. intermedium*, which is really described under the name of *T. ambiguum* in the New Manual, does not have a "creeping rootstock" (as Gray described *T. ambiguum*) but has a biennial or perennial taproot; and it has a leafy stem. As the authors of the New Manual did not at all consider the differences in the subterranean parts of *T. ambiguum* and *T. intermedium*, it was natural that they would not consider the same parts in *T. trifidum* and *T. tenue*, which resemble each other much more closely, and we find the latter as a synonym of the former. *Thelesperma marginatum* Rydb. is ignored altogether, although in my Flora of Montana four collections from that state are cited.

HYMENOPAPPUS

Professor Nelson divides this genus into two groups: one with stems leafy throughout, mostly corymbosely branched and with numerous heads; the other with stems leafy below, the leaves reduced upwards, few or wanting, heads not numerous. In the first group, he places *Hymenopappus tenuifolius* and *H. luteus*. The first of these two always has a leafy stem and many heads, but in *H. luteus* the stem is not more leafy than it often is in *H. filifolius* and *H. cinereus*, and as a rule has less numerous heads than either of them. In the key of the New Manual *H. scaposus* is distinguished from the rest by the following character: "stem scapose, less than 2 dm. high." These characters we often find in both *H. luteus* and *H. araneosus*.

Hymenopappus cinereus Rydb. and *H. ochroleucus* Greene are made synonyms of *H. araneosus*. I take the two first to be the same, but think that the last one should be kept distinct. It is characterized by the denser, more permanent tomentum, a tuft of dense matted white tomentum on the caudex, and achenes with silky and more appressed pubescence. This is characteristic of neither *H. cinereus* nor *H. ochroleucus*. *Hymenopappus parvulus* Greene is made a synonym of *H. scaposus*, but it has a smaller head, no matted white tomentum on the caudex and subcylindrical corolla-throat. The last character would associate it with *H. macroglottis*, *H. lugens*, and *H. eriopodus*, but its corollas are scarcely more than half the size of those of the other species. *H. scaposus* is not found in the region, as limited in the New Manual.

Hymenopappus lugens Greene is to be added to the region, having been collected above Marysvale, Utah, July 21, 1905, Rydberg & Carlton 7049, and *H. eriopodus* A. Nels., found in Diamond Valley, May 19, 1902, Goodding 880, and at Springdale, May 14, 1894, Jones 5261. The last has much broader segments to the leaves than the type and resembles *H. tomentosus* in habit, but has the corolla of *H. eriopodus*. It may prove to be distinct.

OTHAKE

In describing *Polypteris maxima*, Dr. J. K. Small overlooked the fact that the original *Palafoxia Hookeriana* was based on Drummond's plant, which he referred to *Polypteris maxima*. Mr. Bush,

in reëstablishing Rafinesque's genus *Othake* did not notice this discrepancy and the name *Othake Hookerianum* has hitherto been applied to the wrong species. The synonymy of the two species is as follows:

OTHAKE HOOKERIANUM (T. & G.) Bush, Trans. Acad. Sci. St. Louis **14**: 177. 1904

Palafoxia texana Hook. Ic. Pl. *pl.* 148. 1837. Not *P. texana* DC. 1836.

Palafoxia Hookeriana T. & G. Fl. N. Am. **2**: 368. 1842.

Polypteris maxima Small, Fl. SW. U. S. 1288. 1903.

Othake maximum Bush, Trans. Acad. Sci. St. Louis **14**: 179. 1904.

Both Hooker's description of *Palafoxia* and Torrey and Gray's description of *P. Hookeriana* were based on Drummond's specimens, of which there is a duplicate in the Columbia herbarium, and this belongs to *Polypteris maxima* Small. Hooker's plate also illustrates the same thing. It was not strange that Dr. Small was led astray, for the true *O. Hookerianum* is a very rare plant and it was natural to think that the common plant which had been taken for it by Gray, Porter, Coulter, Greene, A. Nelson, myself, and others, should be regarded as *O. Hookerianum*. The latter species should be known as

***Othake sphacelatum* (Nutt.) Rydb. nom. nov.**

Stevia sphacelata Nutt.; Torr. Ann. Lyc. N. Y. **2**: 214. 1827.

Palafoxia Hookeriana subradiata T. & G. Fl. **2**: 368. 1842.

Polypteris Hookeriana A. Gray, Proc. Am. Acad. **19**: 30, mainly.

Othake Hookerianum Bush, Trans. Acad. Sci. St. Louis **14**: 177, as to the description. 1904.

Bush gives as a doubtful synonym *Othake longifolium* Raf.,* but the description does not fit this plant. *O. longifolium* is compared with *O. tenuifolium* Raf., *i. e.*, *Othake callosum* (Nutt.) Bush, and said to be much smaller in every respect than that species. *O. sphacelatum* has about twice as large heads as *O. callosum*.

Torrey's description of Nuttall's *Stevia sphacelata* is rather poor and not ample enough to recognize any species by, but the type, collected by James, is in the old Torrey herbarium and it is un-

*New Fl. Am. **4**: 74. 1838.

mistakably the plant here considered. Being the only available and certain specific name of the plant, *sphacelatum* is therefore taken up.

***Othake macrolepis* sp. nov.**

Annual; stem 3–4 dm. high, strigose-puberulent, and glandular on the upper parts, with ascending branches; leaves alternate, linear, indistinctly 1-ribbed, strigose-puberulent on both sides, 3–5 cm. long, 2–3 mm. wide, short-petioled; involucre obconic, 9–10 mm. high and about as wide; bracts 8–12, in two subequal series, linear-oblongate, abruptly acute, scabrous-hispidulous and slightly glandular, green, with scarious tips, and the inner with narrow scarious margins; rays none; disk-corollas rose-purple, 14–15 mm. long; limb 4–5 mm. long, with linear lobes; achenes linear-obpyramidal, 7 mm. long, 1 mm. thick at the apex, strigose-canescens, pappus-scales 6–8, lanceolate, caudate-acuminate 5–6 mm. long.

This species is most closely related to *O. roseum* Bush, but has much larger heads, flowers, and fruit, and the leaves have a less distinct midrib. In the type of *O. roseum* the disk-corollas are only about 12 mm. long. There is no full-grown fruit in the type sheet, but other specimens show that the achenes are only 4–5 mm. long and their pappus-scales 2–3 mm. long, acute rather than caudate.

COLORADO: Rule Creek, Bent Co., Aug. 17, 1909, G. E. Osterhout 4097 (type, in herb. N. Y. Bot. Gard.).

PICRADENIOPSIS

In the New Manual, my genus *Platyschkuhria* is accepted, but *Picradeniopsis* Rydb., fully as distinct from *Bahia*, is retained in the latter genus. In *Picradeniopsis* and *Achyropappus* the foliage is impressed-punctate, and the leaves opposite, which is not the case in the other genera included by Gray in *Bahia*. *Bahia* is a shrubby plant of South America with white rays. Using Professor Nelson's generic key, *Picradeniopsis* would key into *Hymenoxys*. It stands nearest to that genus, which has been known under the name *Picradenia*, but differs in the free bracts. *Picradeniopsis* is amply distinct from the non-punctate and alternate-leaved *Bahia* but may have been included in *Achyropappus*. The annual habit and rayless heads of that genus seem to be distinction enough.

Picradeniopsis Woodhousii (A. Gray) Rydb. comb. nov.

Achyropappus Woodhousii A. Gray, Proc. Am. Acad. 6: 546. 1865.

Schkuhria Woodhousii A. Gray, Proc. Am. Acad. 9: 199. 1874.

Bahia Woodhousii A. Gray, Syn. Fl. 1²: 333. 1884.

Dr. Gray in the work last cited includes this species in the annual species of *Bahia*. The plant is, however, perennial with a creeping rootstock, and in habit so closely resembling *P. oppositifolia* that it is often hard to distinguish the two. The flowers are of a much lighter color in *P. Woodhousii*, the rays being ochroleucous or straw-colored, and the pappus-scales are much narrower, lance-subulate, and only slightly scarious-margined.

This should have been included in the New Manual, as the type was collected in northern New Mexico.

PLATYSCHKUHRIA

Platyschkuhria oblongifolia (A. Gray) Rydb. should have been included in Coulter & Nelson's New Manual. It has been collected in southwestern Colorado. See Gray's Synoptical Flora 1²: 332, and my Flora of Colorado 377.

Platyschkuhria desertorum (Jones) Rydb. comb. nov.

Bahia desertorum M. E. Jones, Zoe 2: 249. 1891.

This species is a close ally to *P. integrifolia*, differing mainly in the acuminate bracts.

VILLANOVA

By an oversight *Bahia dissecta* (A. Gray) Britton (*B. chrysanthemoides* A. Gray) was retained in *Bahia* in my Flora of Colorado. It should have been restored to *Villanova*. As nobody seems to have used this generic name in connection with the earliest specific one, the plant should be known as:

Villanova dissecta (A. Gray) Rydb. comb. nov.

Amauria ? dissecta A. Gray, Mem. Am. Acad. 4: 104. 1849.

Villanova chrysanthemoides A. Gray, Pl. Wright 2: 96. 1853.

Bahia chrysanthemoides A. Gray, Proc. Am. Acad. 19: 28. 1883.

Bahia dissecta Britton, Trans. N. Y. Acad. Sci. 8: 68. 1889.

CHAENACTIS

Chaenactis achilleaefolia H. & A. and *C. pedicularia* Greene are both reduced in the New Manual, the former to a variety of *C. Douglasii*, the latter to a synonym of *C. alpina*. I think that both should be kept up as species. The characters separating the former from *C. Douglasii* are not so much the dwarf habit and reduced crowded segments of the leaves, for such conditions are found in the true *C. Douglasii*, as the permanent tomentum and the longer and acute pappus-scales. *C. alpina* is subscapose with peduncles 2–7 cm. long and its involucre is much shorter than the corollas. *C. pedicularia* has leafy although short stems, very short peduncles 1–2 cm. long, and involucre bracts, in the specimens seen, fully as long as the flowers. Apparently *C. pedicularia* is the same as *C. Douglasii*, var. *montana* M. E. Jones,* of which the author states that it has been confused with *C. alpina*, but at the same time points out several distinctions.

CHAMAECHAENACTIS

In reviewing Coulter & Nelson's New Manual, Dr. B. L. Robinson† stated: "No mention, for instance, is made of *Encelia nutans* Eastwood and *Chaenactis scaposa* Eastwood." This is not exactly true, for the latter is included in the New Manual. It was not strange, however, that Dr. Robinson should overlook the fact, for who would expect to find it under the name *Actinella carnos*a A. Nels.? I doubt if Professor Nelson has seen any specimens, for if he had I do not think he would have transferred it to *Actinella*. The description in the New Manual is a verbatim copy of Miss Eastwood's description. The plant is evidently more closely related to *Chaenactis*, in which genus it was first placed, than to *Actinella*. If Professor Nelson was unwilling to adopt my generic name *Chamaechaenactis*, it would have been much better to retain the species in *Chaenactis* than to transfer it to *Actinella*, where it is wholly out of place. Besides, *Chamaechaenactis* is fully as good as Nelson's own genera *Tonestus* and *Wyomingia*, and far more so than *Nacrea* and *Enomegra*. The last has no scientific standing at all, being distinguished from *Argemone* only by the

* Proc. California Acad. Sci. II. 5: 700. 1895.

†Rhodora 12: 16. 1910.

yellow instead of milky white sap. In which genus should a species with ochroleucous or white sap, turning yellowish, be placed?

Correction

The California specimens referred to *Scutellaria veronicifolia* in a previous installment of the studies belong to *S. californica* A. Gray, and not to the former, having a different corolla.

NEW YORK BOTANICAL GARDEN.